Annual Report: North Central Regional
Potato Variety Evaluation, 1964

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1. Introduction: The Ohio Agricultural Experiment Station is one of 12 state Experiment Stations cooperating in the regional evaluation of newly released breeding lines of potatoes. The number of new selections is restricted to 15 each year, and of these five are selected for further investigation. Each Station follows a prescribed method of evaluation, the main variables being individual differences in soil and climatic effects due to location. Standard varieties such as Katahdin and Cobbler are grown in comparison with the two maturity groups. The results of the 12 members of the committee are combined at the end of each year, thus providing a broad overview of varietal performance. Some varieties are promoted to further trial, others held for specific breeding purposes and many are dropped from the list. There is generally a 4 or 5 year period of evaluation of a new variety before it becomes a recommendation, a weeding out process which protects the grower and keeps the number of available varieties to a workable minimum.

2. Methods: Healed cut seed of each variety was planted in 4 twenty-five foot rows on May 22, 1964. The seed spacing was 10 inches in rows 36 inches apart. A rye cover was plowed down, and 5-10-10 fertilizer at the rate of 1000 pounds to the acre was applied in bands at planting with 3 pounds per acre of granular Thimet. Zineb, 3 pounds per acre was applied at 10 day intervals and Thiodan 0.5 pounds per acre was used in August twice for aphids. All plots were harvested on October 9th and machine graded within 10 days. Specific gravity was determined by hydrometer. Typical examples of each line were recorded on black and white and color photographs.

3. Environmental Conditions:

A. Soil test results

Soil type: Wooster Silt Loam
Organic Matter: 3 per cent
Lime Deficit: 4 tons per acre
pH: 5.3
Pounds per acre, as oxide:
Phosphorus - 100 Potassium - 260 Calcium - 2400

B. Climatological Conditions:

Month	Rainfall in, Inches	Evaporation Inches	Temperature Mean	Temperature Dep. from Ave.
May	4.53	6.93	58.5	1.6
June	2.20	7.42	67.5	-0.9
July	5.03	7.05	71.6	-0.7
Aug.	4.45	5.47	66.4	-3.4
Sept.	0.56	4.87	61.6	-2.1
Oct.	1.13	3.69	47.8	-4.4

4. Results:

A. Components of Yield

Of the early group, three varieties exceeded the marketable yield of Cobbler and Superior, one of which is the recently named Norgold Russet, formerly ND4192-3. For the third straight year red varieties have out performed white varieties in terms of yield and total solids per acre. Among the late varieties, all whites evaluated were significantly lower in yield than Katahdin, whereas two red lines, La 12-4 and TL 7935 exceeded the standard and three were not significantly more productive than Katahdin, as may be seen in Table 1.

B. Components of Quality

The specific gravity of 1.070 has been arbitrarily established as a point below which unsatisfactory processing characteristics may be expected in potatoes. The data in Table 2 show that many of the varieties under study would be rated borderline on this feature. In general, the late varieties were associated with a higher per cent solids than the early lines. Katahdin, Cobbler and TL 7627 rated highest among the white group, but Wisc. 563 a red had a higher per cent solids and specific gravity reading than all whites. In terms of total solids produced per acre, LA 1-24 (red) was significantly greater than Katahdin, B 4523-8 significantly inferior, but the remaining lines were in the same general magnitude.

C. Grade Defects

The wide variation in defects, noted in Table 3, was due to external defects primarily. Scab was generally light for the season as a whole but Cobbler and WY 1122 had fairly heavy infections. Most striking of all varieties crossing the grading table was the variety B 4523-8 in regard to second growth. This line would be ideal in studies of premature eye growth, as well as vascular discoloration.

D. External Characters

Three white varieties were rated higher in uniformity and attractiveness than Katahdin, as may be seen in Table 4. La 12-4, one of the largest red varieties was comparable to Norland the early red standard.

5. Summary

Considerations of yield, quality and grade defects among the late white varieties grant Katahdin one of the highest over-all merit ratings. Of the early white types Superior and Norgold Russet rated higher than the standard for early lines, Cobbler. Norgold may hold great promise for the Ohio table stock trade, being an attractive variety of moderate yield. Current studies on sprout control and storage behavior may help to overcome its major shortcoming to date, that being a rather short rest period.

Table 1. The Total and Marketable Yield and Grade of 17 varieties of Potatoes Tested at Ohio Agricultural Experiment Station, 1964. Average of 4 Replicates.

Variety	Total Yield Cwt/Acre	Mkt. Yield Cwt/Acre	Per Cent U. S. No. 1
Early to Medium Early			
Neb. 412.55-2*	340	266	78.3
ND 4192-3	329	252	76.9
Norland *	258	240	92.9
Cobbler	276	215	77.0
Superior	242	221	90.9
Medium to Late			
Neb. 4.56-9	293	260	88.5
Neb. 302.50-5	308	241	77.9
Wisc. 563 *	327	282	86.6
La. 12-4 *	381	357	93.4
TL 7627	298	229	76.4
TL 7935 *	361	317	87.5
ND 4524-7R *	345	312	90.0
Ia 57410 *	300	283	94.3
B 4523-8	311	192	61.4
WY 1122	290	252	86.8
Katahdin	324	290	89.8
Red Pontiac *	396	332	83.8
*Red Varieties Designated by Asterisk.			
F Value	4.27	5.73	8.39
F Value required for significance .05% Level		1.86	.01% Level 2.40
LSD .05% Level	26.50	24.87	3.95

Table 2. The Specific Gravity, Per Cent Total Solids and Total Solids per Acre of 17 Varieties of Potatoes Tested at OAES, 1964. Average of 4 Replicates.

Variety	Specific Gravity Hydrometer	Per Cent Solids Von Scheele	Total Solids Lbs./Acre
Early to Medium Early			
Neb. 412.55-2*	1.073	18.74	4988
ND 4192-3	1.072	18.53	4671
Norland *	1.071	18.32	4397
Cobbler	1.077	19.58	4212
Superior	1.076	19.37	4273
Medium to Late			
Neb. 4.56-9	1.071	18.32	4769
Neb. 302.50-5	1.079	20.00	4818
Wisc. 563 *	1.086	21.48	6049
La 12-4 *	1.076	19.37	6907
TL 7627	1.080	20.21	4620
TL 7935 *	1.072	18.53	5872
ND 4524-7R *	1.077	19.58	6111
Ia 57410 *	1.078	19.79	5598
B 4523-8	1.076	19.37	3721
WY 1122	1.076	19.36	4877
Katahdin	1.082	20.64	5373
Red Pontiac *	1.072	18.53	6152
*Red Varieties Designated by Asterisk.			
F Value	-----	-----	5.91
F Value required for significance .05% Level		1.86	.01% Level 2.40
LSD .05% Level			1533.89

Table 3. Summary of Grade Defects, 17 Varieties of Potatoes Tested, OAES, 1964. Average of 4 Replicates, Per Cent.

Variety	Scab Incidence Per Cent	Scab Incidence Area	Scab Incidence Type	Growth Cracks	Second Growth	Sun Green	Vascular Discolor.	Defect Free
Early to Mid Early								
Neb. 412.55-2 *	1	1	2	11	9	1	6	72
ND 4192-3	3	1	1	5	3	12	0	77
Norland *	1	1	2	4	0	1	0	94
Cobbler	22	2	2	1	6	10	2	59
Superior	5	1	1	0	0	4	0	91
Med. to Late								
Neb. 4-56-9	16	3	2	2	6	11	0	65
Neb. 302.50-5	5	1	1	3	2	2	1	87
Wisc. 563 *	0	0	0	12	3	6	1	78
La 12-4 *	15	2	2	1	2	1	3	78
TL 7627	4	2	2	5	6	17	0	68
TL 7935 *	15	2	3	3	4	5	0	73
ND 4524-7R *	4	1	2	10	0	0	0	86
Ia 57410 *	10	1	1	0	1	0	8	81
B 4523-8	10	1	1	11	35	8	20	16
WY 1122	21	1	1	6	1	16	1	55
Katahdin	12	1	2	0	7	0	0	81
Red Pontiac	10	3	3	0	0	10	0	80

* Red Varieties Designated by Asterisk.

Only one case of internal necrosis was noted, that being in Wisc 563. Hollow heart was absent in all varieties sampled.

Table 4. Summary of External Characters, 17 Varieties of Potatoes Tested at Ohio Agricultural Experiment Station, 1964.

Variety	Skin Color	Skin Texture	Bud End	Eye Depth	Eye Color	Eye Size	Shape Tuber	Wt/lbs. 25 tubers	Attractive 1-Poor-Ex.-5
Early to Midseason									
Neb. 412.55-2	Red	Smooth	Flsh.	Med.	Purp.	Med.	Cyl.	10.6	4
ND 4192-3	Wh.	Russet	Flsh.	Flsh.	Wh.	Sm.	Cyl.	10.4	5
Norland	Red	Smooth	Shal.	Flsh.	Purp.	Med.	Cyl.	10.2	4
Cobbler	Wh.	Smooth	Flsh.	Shal.	Wh.	Sm.	Obl.	10.5	4
Superior	Wh.	Smooth	Med.	Med.	Wh.	Sm.	Obl.	10.4	5
Medium to Late									
Neb. 4.56-9	Wh.	Smooth	Shal.	Med.	Wh.	Med.	Round	9.9	2
Neb. 302.50-5	Wh.	Russet	Flsh.	Flsh.	Wh.	Med.	Cyl.	10.8	5
Wisc. 563	Red	Smooth	Deep	Med.	Purp.	Lge.	Obl.	10.3	3
La 12-4	Red	Smooth	Shal.	Med.	Purp.	Med.	Cyl.	11.8	4
TL 7627	Wh.	Smooth	Shal.	Flsh.	Wh.	Med.	Cyl.	10.0	4
TL 7935	Red	Smooth	Shal.	Med.	Purp.	Med.	Cyl.	11.2	3
ND 4524-7R	Red	Smooth	Shal.	Flsh.	Purp.	Sm.	Round	10.3	3
Ia 57410	Red	Smooth	Shal.	Med.	Purp.	Med.	Obl.	10.9	4
B 4523-8	Wh.	Smooth	Flsh.	Flsh.	Wh.	Med.	Obl.	13.0	1
WY 1122	Wh.	Smooth	Med.	Flsh.	Wh.	Sm.	Cyl.	11.7	2
Katahdin	Wh.	Smooth	Med.	Flsh.	Wh.	Sm.	Obl.	11.0	4
Red Pontiac	Red	Smooth	Flsh	Deep	Purp.	Lge.	Obl.	11.0	3